

# PLASTIC ZIPPER BAG

The present invention relates to a plastic zipper bag, and more particularly to a plastic bag with a zipper on an inner surface of an upper opening portion, the zipper having a groove and a protrusion engaging with and disengaging from each other.

Conventionally, various kinds of plastic bags with zippers, each having a groove and a protrusion engaging with and disengaging from each other, at their upper opening portions in the inner surfaces have been provided.

The zipper 5 is fused with the plastic films at both ends 5a with the groove 7 and the protrusion 8 engaged with each other. Therefore, even when the zipper 5 is opened, the both ends 5a are closed, and in closing the zipper 5 again, the user pinches the ends 5a

with his/her fingers from outside and slides his/her fingers from the ends 5a along the zipper 5 while pressing the protrusion 8 and the groove 7 against each other.

When the zipper 5 of the plastic bag is opened, the area of the open portion 3 (hatched in Fig. 13b) is small. The end portions where the zipper 5 is fused with the plastic films are large (see "2a" in Fig. 13c) because the amount of the melted resin there is large and because the groove 7 and the protrusion 8 are fixed on the inner surfaces of the plastic films. Accordingly, the items which can be put into and taken out of the plastic bag through the open portion 3 are of sizes not more than a dimension D3, which is calculated by subtracting a width of the portions where the groove 7 and the protrusion 8 are covered by each other from a dimension D2 smaller than an inner dimension D1.

Also, if the zipper 5 shrinks due to its own rigidity, the open portion 3 cannot be open sufficiently wide. Therefore, narrow plastic bags with widths not more than 40mm have not been manufactured.

## SUMMARY OF THE INVENTION

An object of the present invention is to provide a plastic zipper bag which can contain larger items than conventional plastic zipper bags by effectively using the inner dimensions of the plastic bag.

Another object of the present invention is to provide a narrower plastic zipper bag than conventional plastic zipper bags, which items can be put into and taken out of.

In order to attain the objects above, a plastic bag according to

the present invention has a zipper on an inner surface of an upper opening portion of a bag body, the zipper having a groove and a protrusion engaging with and disengaging from each other, and both sides in the upper portion of the bag body are open.

5           In the plastic bag according to the present invention, because the both sides in the upper portion of the bag body are open, the upper portion of the bag body can be open wide in spite of the existence of the zipper. Thereby, effective use of the inner dimensions of the bag body becomes possible, and bigger items can be put in the plastic bag,  
10 compared with conventional plastic bags. Also, the opening of the bag is not restricted by the rigidity of the zipper, and it is possible to manufacture zipper bags with widths less than 40mm, which has been the limit, for example, zipper bags with a width of approximately 10mm.

15           Further, making use of the characteristic that the both sides of the upper portion of the bag body are open, it is possible to draw cords and cables contained in the bag through the open portions at the both sides. Thereby, electrical connections can be kept while the cords and cables are contained in the bag, and redundant portions of the  
20 cords and cables can be put in order compactly.

          In the plastic bag according to the present invention, the groove and the protrusion are not fused even at ends, and therefore, there are no start points of engaging the groove and the protrusion with each other, which exist in conventional zipper bags. In order for  
25 the engagement, the user puts a part of the protrusion in the groove and presses the rear sides of the zipper by finger. When it is a

narrow bag, the user must press only one time. When it is a wide bag, the user must press the zipper several times to close the bag.

The plastic bag according to the present invention may have a plural number of chambers. For example, by putting at least one  
5 heat fusible plastic sheet between a front film and a back film composing the bag body, a plural number of chambers can be formed. Also, by fusing the front film and the back film along at least one vertical line, a plural number of chambers can be formed.

## 10 BRIEF DESCRIPTION OF THE DRAWINGS

Figs. 1a and 1b show a plastic bag according to a first embodiment under a manufacturing process, Fig. 1a being a front view and Fig. 1b being a sectional view.

Figs. 2a and 2b show a completely manufactured plastic bag  
15 according to the first embodiment, Fig. 2a being a front view and Fig. 2b being a sectional view.

Figs. 3a and 3b show a preparation stage for opening the plastic bag according to the first embodiment, Fig. 3a being a front view and Fig. 3b being a sectional view.

20 Figs. 4a and 4b show an open state of the plastic bag according to the first embodiment, Fig. 4a being a front view and Fig. 4b being a sectional view.

Figs. 5a, 5b and 5c show a plastic bag according to a second embodiment, Fig. 5a being a front view, Fig. 5b being a sectional view  
25 taken along the line X-X and Fig. 5c being a sectional view taken along the line Y-Y.

Fig. 6 is a sectional view of the plastic bag according to the second embodiment in an open state.

5 Figs. 7a and 7b show a step of extrusion molding a plastic bag according to a third embodiment, Figs. 7a and 7b being sectional views.

Figs. 8a and 8b show a step of melting and cutting the plastic bag according to the third embodiment, Fig. 8a being a sectional view and Fig. 8b being a front view.

10 Fig. 9 is a front view of a plastic bag according to a fourth embodiment.

Fig. 10 is a perspective view of the plastic bag according to the fourth embodiment, showing an exemplary usage of the plastic bag.

Fig. 11 is a perspective view of a plastic bag according to the fourth embodiment in an open state.

15 Fig. 12 is a front view of a plastic bag according to a fifth embodiment.

20 Figs. 13a, 13b and 13c show a conventional plastic bag, Fig. 13a being an upper view of the plastic bag in a closed state, Fig. 13b being an upper view of the plastic bag in an open state and Fig. 13c being a front view.

Fig. 14 is an illustration of a zipper composed of a groove and a protrusion.

## BEST MODES FOR CARRYING OUT THE INVENTION

25 Embodiments of a plastic zipper bag according to the present invention are hereinafter described with reference to the

accompanying drawings.

#### First Embodiment; See Figs. 1a-4b

Figs. 1a-4b show a plastic zipper bag 10A according to a first embodiment of the present invention.

5 As shown in Figs. 1a and 1b, the plastic bag 10A is composed of two plastic films 11 and 12 fused together as shown by the hatched portions at both sides 13 and in an upper portion 14.

As the films 11 and 12, single-layered films fusable with each other or laminate composite films with mutually fusable materials coated on at least the respective inner surfaces are used. At the  
10 upper ends 14 of the films 11 and 12, on the inner surfaces, a zipper 5 composed of a groove 7 made in a base 6 and a protrusion formed on another base 6 (see Fig. 14) is fused. The zipper 5 may be formed integrally with the films 11 and 12.

15 A conventional plastic zipper bag has right and left sides 13 fused from the bottom to the upper portion 14 where a zipper 5 is provided. With respect to the zipper bag 10A according to the present invention, however, upper parts 13a of the right and left sides 13 are not fused.

20 Further, the zipper bag 10A has a perforated line 16 and a slit 17 in the upper portion 14. The perforated line 16 is used to cut off the upper fused end when opening the bag 10A, and the slit 17 is to start the cutting-off.

An item P is put into the bag 10A shown by Figs. 1a and 1b  
25 through an open bottom 15, and then, the bottom 15 is fused as shown by the hatched portion in Fig. 2a. Thereby, the plastic bag 10A has

an upper portion 14 with open right and left sides 13a.

A user receives the bag 10A containing an item P in the state shown by Figs. 2a and 2b. In order to take the item P out of the bag 10A, first, as shown by Figs. 3a and 3b, the user cuts off the upper  
5 fused end along the perforated line 16 to open the bag 10A.

Next, as shown by Figs. 4a and 4b, the groove 7 and the protrusion 8 of the zipper 5 are disengaged from each other, and the upper portion 14 is folded back. Thereby, the upper portion 14 of the bag 10A becomes wide open. In this state, the item P sticks out of  
10 the upper portion 14 and can be taken out of the bag 10A easily. Further, it is easy to put the item P into the bag 10A again.

Thus, according to the first embodiment, since the upper portion 14 of the bag 10A has unfused open right and left sides, the upper portion 14 can be wide open in spite of the existence of the  
15 zipper 5 (see Figs. 4a and 4b), putting in and out of an item P, which is of a width nearly equal to the inner width D1 of the bag 10A, is possible.

With respect to a conventional bag, when the width D is small, it is difficult to open the upper portion 14 because of the rigidity of the  
20 zipper 5. With respect to the bag 10A, however, even when the width D is small, for example, approximately 10mm, it is easy to open the upper portion 14.

The upper fused end and the perforated line 16 of the bag 10A are not indispensable and can be omitted. Also, if a small hole is  
25 made in the upper portion 14, the bag 10A can be used to hang and display a commodity.

### Second Embodiment; See Figs. 5a-6

Figs. 5a-6 show a plastic zipper bag 10B according to a second embodiment of the present invention.

5 The bag 10B is, as Figs. 5a, 5b and 5c show, basically of the same structure as the bag 10A according to the first embodiment. Therefore, the same members and the same parts are provided with the same reference symbols as those in Figs. 1a-4b, and descriptions of these members and parts are omitted.

10 A characteristic of the bag 10B is that at least one heat fusable plastic sheet 18 is nipped between the front and back films 11 and 12, so that the bag 10B has at least two chambers 19a and 19b. The sheet 18 may be a plastic film, a non woven fabric, a foam plastic sheet or the like.

15 Fig. 6 shows a state where the upper portion 14 of the bag 10B is folded back and becomes open. In this state, the upper end of the sheet 18 is located above the folded-down zipper 5 (groove 7 and protrusion 8), and items can be put into and put out of the chambers 19a and 19b through wide-open portions 20a and 20b respectively. This bag 10B can be used, for example, as a container for two CDs.  
20 When a non woven fabric or a foam plastic sheet is used as the sheet 18, the sheet 18 functions as a cushion. Also, printing may be performed on the transparent films 11 and 12 composing the bag body 10B.

### Third Embodiment; See Figs. 7a-8b

25 Figs. 7a-8b show a manufacturing method of plastic zipper bags 10C according to a third embodiment of the present invention.



First, as Fig. 7a shows, while a plastic film 30 is extruded from a die into a tube, a groove 7 and a protrusion 8 composing a zipper are extruded such that the groove 7 and the protrusion 8 are stuck integrally on the inner surface of the film 30. By adjusting the  
5 amount of resin extruded from the die and the volume of air blown into the tube, the size of the bag and the thickness of the film 30 are determined. Next, the film 30 is folded such that the groove 7 and the protrusion 8 face each other (see Fig. 7b).

Thereafter, as Fig. 8b shows, while the folded film 30 is  
10 transported in a direction (shown by arrow F) step by step by a distance G, the film 30 is melted and cut at a position shown by the alternate long and dash line H. Before this melting/cutting step, cut-offs 31 are made in the upper portion 14. This is to permit each produced bag 10C to have an upper portion 14 with open right and left  
15 sides. Further, a perforated line may be made in the upper portion 14.

The plastic zipper bag 10C produced by the above-described method is basically of the same structure as the bag 10A according to the first embodiment and has the same advantages as those of the bag  
20 10A.

#### Fourth Embodiment; See Figs. 9-11

A plastic zipper bag 10D according to a fourth embodiment is used to contain cords and cables of electric appliances such as a TV, a personal computer, an audio set, etc.

25 As Fig. 9 shows, the bag 10D is basically of the same structure as the bag 10A according to the first embodiment. Therefore, the

same member and the same parts are provided with the same reference symbols as shown in Figs. 1a-4b, and descriptions of these members and parts are omitted.

5 A characteristic of the bag 10D is that the upper portion 14 has relatively large cut-offs 35 at right and left sides, resulting in open right and left sides in the upper portion 14. Therefore, as Fig. 11 shows, it is possible to open the upper portion 14 of the bag 10D considerably wide.

10 In the rear side of a TV, a personal computer, an audio set or the like, usually, redundant portions of cords and cables are left disordered and entangled. As Fig. 10 shows, by putting the middle portions of the cords and cables in the bag 10D and by drawing the cords and cables through the cut-offs 35, the redundant portions of the cords and cables can be put in order compactly while the electrical  
15 connections are kept.

The bag 10D has a small hole 36 in the bottom fused portion 15. This hole 36 is to permit the bag 10D to be hung from a hook on a column or a wall.

Further, if the bottom portion 15 is made into a gusset, the bag  
20 10D will have a wide bottom.

#### Fifth Embodiment; See Fig. 12

Fig. 12 shows a plastic zipper bag 10E according to a fifth embodiment of the present invention.

This bag 10E is basically of the same structure as the bag 10A  
25 according to the first embodiment. The same members and the same parts as those shown in Figs. 1a-4b are provided with the same

reference symbols, and description of these members and parts are omitted.

A characteristic of the bag 10E is that the front and back films 11 and 12 have vertical linear fused portions 41 (hatched portions), so  
5 that the interior of the bag 10E is divided into three chambers 42a, 42b and 42c.

The bag 10E have the same advantages as the bag 10A, and moreover, the chambers 42a, 42b and 42c can be used separately.

#### Other Embodiments

10 Plastic zipper bags according to the present invention are not limited to the embodiments above, and various changes and modifications are possible within the scope of the invention.

The shapes of the sections of the protrusion and the groove of the zipper are arbitrarily designed. The method for manufacturing  
15 the bag bodies can be arbitrarily adopted, and also, the size of the bags can be arbitrarily designed for the purpose.

Further, it is possible to combine the second embodiment and the fifth embodiment to produce a plastic bag with a large number of chambers.

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